

Abstract Submitted  
for the NEF07 Meeting of  
The American Physical Society

**Production of ultracold molecules via photoassociation through a Feshbach resonance** PHILIPPE PELLEGRINI, MARKO GACESA, ROBIN CÔTÉ, University of Connecticut — We present a theoretical investigation of photoassociation in the vicinity of a Feshbach resonance for the production of ultracold molecules in their lowest vibrational levels. The formation of ultracold molecules is of particular interest for the realization of quantum computing systems or the development of a cold physical chemistry which proposes to control elementary chemical reactions with or without electro-magnetic fields. Photoassociation, which occurs when two colliding atoms absorb a photon to form a molecule in a bound rovibrational level, has been widely used to produce ultracold dimers but the use of a magnetically induced Feshbach resonance enhances dramatically the probability density at short range allowing efficient transitions even for deeply bound levels. We illustrate this effect in both heteronuclear and homonuclear systems.

Philippe Pellegrini  
University of Connecticut

Date submitted: 05 Oct 2007

Electronic form version 1.4